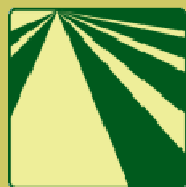


Value Chain Analysis of Flowers produced for Export by Smallholder Growers in Kenya – 1. Baseline survey



fintrac

Produced by Fintrac Inc

**for the International Institute for Environment
and Development**

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INTRODUCTION

The horticulture industry in Kenya has performed impressively compared with other agriculture sectors over the last two to three decades. By 2008 the subsector accounted for about 33 percent of Agricultural Gross Domestic Product (GDP) and 38 percent of export earnings. In terms of value, the subsector generated US\$ 2.4 billion (domestic and export value) which was well above the values of tea (US\$ 738 million) and coffee (US\$ 91 million). In 2009, horticultural exports alone generated an estimated Ksh 71.60 billion or US\$ 895 million. However, supplies of horticultural produce for export fell because of drought. Market demand for some products also dropped because of the recession in Europe, Kenya's main market. Relative to 2008, the combined effects of these two factors caused a 15 percent decline in the quantity of exports and a 3 percent decline in value expressed in Kenyan shillings. The foreign exchange value in US dollars dropped by 13 percent (Table 1).

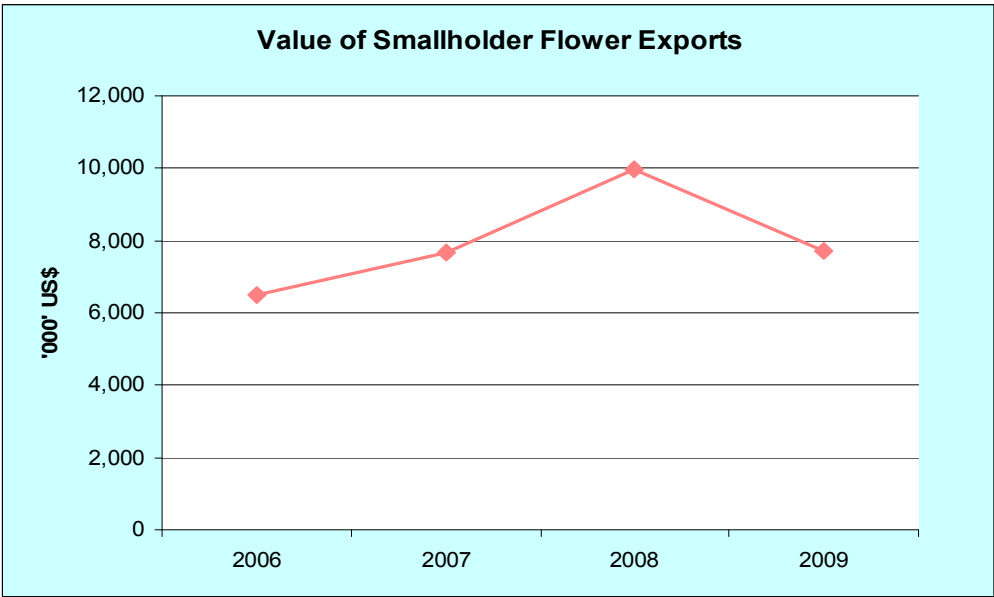
Table 1: Calendar Year Exports 2008-2009

Commodity	2008			2009		
	Quantity	Value		Quantity	Value	
	Kgs	Kshs	US\$	Kgs	Kshs	US\$
Cuttings, bulbs and tubers	4,543,036	3,610,890,600	50,527,239	6,177,729	4,395,074,452	54,970,203
Cut flowers	113,569,136	30,691,378,493	429,464,861	114,123,361	32,610,071,609	407,861,639
Fresh foliage	514,472	6,489,079	90,802	93,878	81,123,163	1,014,626
Total flowers	118,626,644	34,308,758,172	480,082,903	120,394,968	37,086,269,224	463,846,469
Fresh vegetables	78,157,022	17,948,404,024	251,152,253	73,872,358	17,168,849,884	214,734,740
Dried vegetables	17,090,863	931,729,309	13,037,700	4,169,053	240,428,746	3,007,097
Processed vegetables	24,056,365	4,489,709,960	62,824,570	14,442,302	1,981,998,733	24,789,312
Total vegetables	119,304,250	23,369,843,294	327,014,523	92,483,713	19,391,277,363	242,531,150
Fresh fruit	24,053,946	1,790,362,015	25,052,559	35,266,454	2,380,727,699	29,776,307
Processed fruit	121,208,724	6,889,044,929	96,398,496	73,290,517	5,202,521,497	65,069,129
Total fruit	145,262,670	8,679,406,944	121,451,055	108,556,971	7,583,249,196	94,845,436
Nuts	29,463,369	1,169,976,847	16,371,501	27,410,997	1,278,347,491	15,988,585
Other vegetable products	6,290,137	5,602,583,261	78,397,021	6,652,819	5,534,751,076	69,224,400
Spices	4,182,433	607,225,914	8,496,920	4,974,646	724,099,742	9,056,481
Grand Total	423,129,503	73,737,794,432	1,031,813,924	360,474,113	71,597,994,093	895,492,521

Source KRA Customs compiled by KHDP

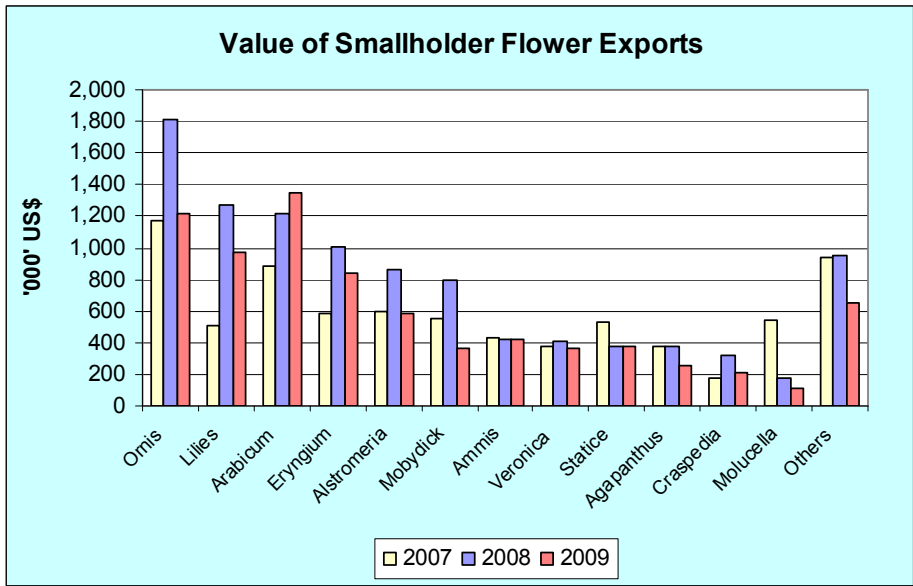
Flowers were the only category that did not drop in quantity or value, accounting for 33 percent of all horticultural exports in 2009. Exports of field-grown “summer flowers”, mainly grown by smallholders, did not hold up as well as roses, carnations, lilies and other greenhouse flowers. Field-grown flowers are prone to the drought and dropped in value by 23 percent in 2009 (Figure 1). According to the Horticultural Crops Development Authority (HCDA), exports of all summer flower varieties dropped, with the exception of Arabicum (Figures 1 & 2).

Figure 1: Value of smallholder flower exports



Source: Horticultural Crops Development Authority compiled by KHDP

Figure 2: Value of summer flower exports 2007-2009



OBJECTIVES AND JUSTIFICATION OF THE STUDY

Despite the 2009 performance, long-term export prospects for smallholder-grown flowers in Kenya appear to be good if efficient value chains can be developed and expanded. The new business model for sustainable trading relationships project (NBMSTR), funded by the Bill and Melinda Gates Foundation, promotes business practices that develop longer and less opportunistic trading relationships, improve the flow of information and payment terms and reduce the cost to farmers of complying with new standards. It is responsive to the economic realities of smallholder production but does not compromise quality, food safety or risk for buyers. Designing and implementing these models in partnership with suppliers and buyers will help smallholders secure market access, increasing long-term benefits and expand their sales volumes for trade. The objectives of NBMSTR are to:

- **secure** market access for smallholders, the rural poor and their organizations
- **increase** net benefits, equity, and sustainability for these producers
- **expand** the volume of trade between smallholders, the rural poor and commercial actors.

The International Institute for Environment and Development (IIED) is an NBMSTR implementing partner. IIED has entered into an agreement with Wilmar Agro Limited, a flower exporting company in Kenya, to develop a sustainable business model for smallholder flower exports. Wilmar is already utilizing a unique business model, forming new producer groups that incorporate a high degree of transparency. They build the capacity of very poor farmers to grow quality flower products; make demands on public policy for infrastructure; and integrate the farmers into the formal sector by getting them bank accounts and access to credit at commercial rates.

Fintrac Inc., an international agribusiness development firm, has been working with Wilmar Agro to develop smallholder farmer capacity to produce quality flowers in Kenya for the last four years. Fintrac's expertise lies in developing sustainable, market-led, producer/buyer trade relationships. The objective of this study is to gather baseline data necessary for monitoring the NBMSTR project's impacts on creating new sales of flowers grown by smallholders supplying Wilmar.

Expected Outputs of the Study

IIED, Fintrac and other partners will work with Wilmar and its suppliers to create new flower products for customers in the UK and the US. The overall study will document and report on the success of these interventions. Data will be collected and analysed in relation to four aspects of the business model:

- Baseline information at the household level for smallholders in the flower value chain
- List of key actors in the smallholder value chain and their characteristics
- Baseline survey information for entire value chain and definition of trading relationships
- Identification of constraints and opportunities for specific members of the supply chain

This report has been produced in the fulfillment of the first of these outputs.

Justification

The Asda supermarket chain in the UK has pledged to increase their African sourcing by £30 million annually and one of the key products of interest is cut flowers. This new market would create a direct sales mechanism for 30 percent of flowers Wilmar currently exports, reducing the company's dependence on the volatile Dutch auction market, where prices and demand fluctuate. This more stable demand will enable the best farmers to upgrade and diversify their market. The project estimates that up to 1,500 more smallholders can supply flowers to Wilmar without oversupplying the market, and it aims to give those smallholders that opportunity.

Asda has selected four unique bouquets made from flowers and foliage produced by smallholders for Wilmar. The bouquets will be tested in UK markets. A commercially viable product would open the door to new and hopefully long-term retail markets for smallholder flower growers in Kenya, helping to improve their livelihoods. To ensure sustainability of Asda's offer, the growers have achieved the Rainforest Alliance certification label, as required by the market.

To properly monitor the impact of this activity, it is necessary to establish baseline data against which progress can be measured. This data is required at the household level to ascertain current income, production and investment levels both for those already involved in the production of flowers and for those who have not yet had the opportunity to participate. To fully understand how the system works and identify constraints and opportunities, as well as determine baseline volumes and values, it is also critical to identify who is participating in this value chain, what role they play and how they interact to get the product from the farm to the market. As trading relationships are at the heart of the NBMSTR project, it is also essential to establish a baseline measure for the quality of those relationships, in order to track their evolution over the course of the Asda partnership.

This report contains analysis of information on income, production and investment in flower activities, gathered at the household level. It will be followed by two more reports – one examining the trading relationships between the farmers and Wilmar, and the second providing detailed information on the value chain from the farmers to the Kenyan border.

METHODOLOGY

Survey Tool and Personnel

The survey tool was a structured questionnaire developed by the NBMSTR project team for the bean value chain in Ethiopia. It was reviewed and edited to suit Kenya's smallholder flower value chain. The tool was pre-tested in the field with Gatitu flower growers group near Thika, and then changes were made before actual data collection.

A survey team of 10 enumerators, three data clerks and four supervisors was selected to carry out the field work. The minimum qualification for the enumerators and data clerks was a secondary school level of education and fluent communication in either the national language, Kiswahili, or the local language in the study area, Kikuyu. The supervisors had at least a bachelor's degree and had prior experience in surveys. They were responsible for the accuracy and consistency of collected data.

A one-day training workshop was held at the Kenya Agricultural Research Institute (KARI) in Thika to introduce the team to the project goal and objectives and to teach them how to apply the survey tool.

Data collected using the questionnaire included information about the study area, household demographics, land ownership and use, assets, involvement of men and women in flower production and income earning, sources of household income, credit and spending priority, quality assurance and trading relations.

Secondary data on Rainforest Alliance certification costs and export market volumes and value was obtained from the exporters, Wilmar Agro and Naturegrown Flowers Ltd.

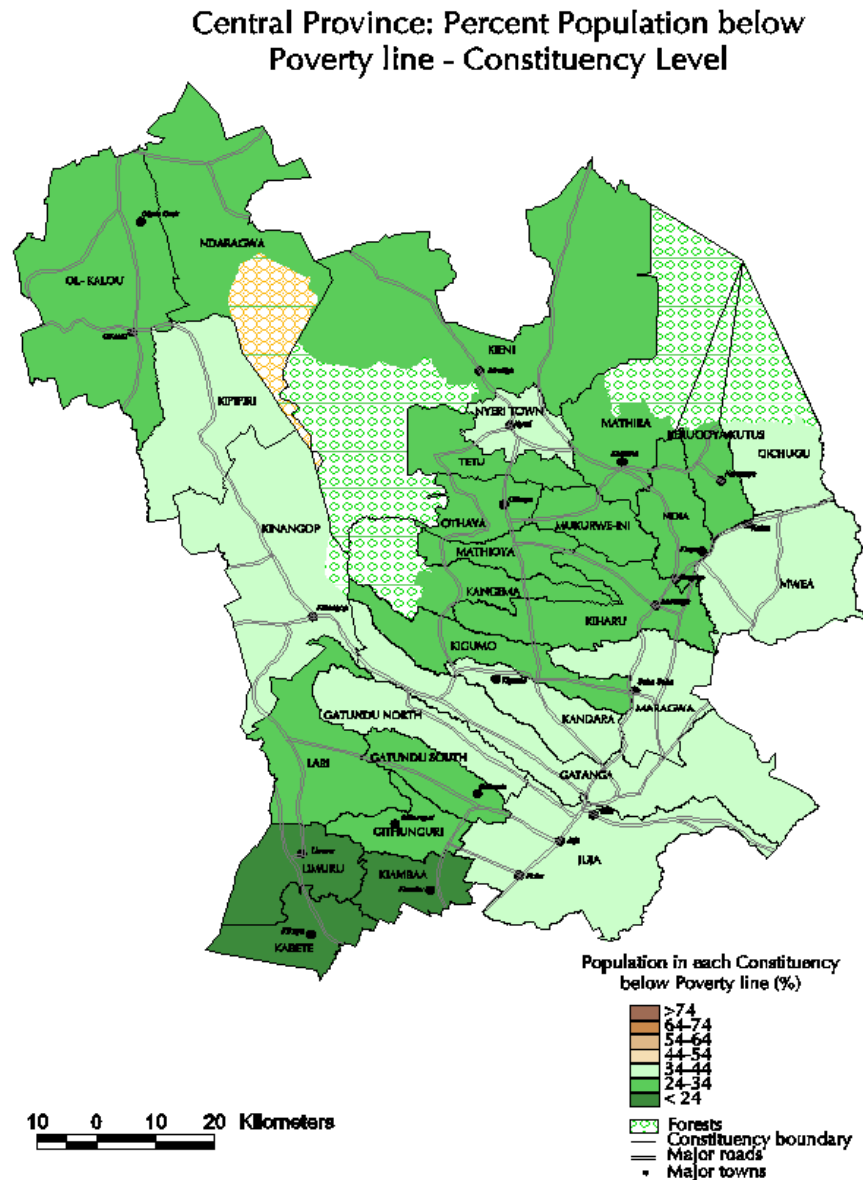
Site Description

Central Province in Kenya is made up of 29 political constituencies. The poverty rate is averaged at 31 percent, ranging from 16 percent in Kabete to 43 percent in Nyeri Town. 17 of the 29 constituencies have a poverty headcount index that is above the provincial mean of 31 percent. The 29 political constituencies in Central Province contribute almost 8 percent to total national poverty. With

an estimated 1.1 million poor people, two-fifths (41 percent) are concentrated in eight of the 29 constituencies, namely Juja (8.4 percent), Gatanga (5.3 percent), Mwea (5 percent), Kandara (5 percent), Kinangop (4.8 percent), Kiharu (4.5 percent), Ol-Kalou (4.3 percent) and Kieni (3.7 percent). The smallest contribution to provincial poverty comes from Ndarangwa.

The province has a population of 3,724,157, according to census data from 1999. It occupies 13,191 square kilometers. The climate is generally cooler than other parts of Kenya because of the region's higher altitude. The survey areas of Thika and Limuru districts are closer to Nairobi while Nyeri is to the southwest of Mount Kenya. Rainfall is bimodal, with the long rains falling from March to May, and short rains in October and November. This survey was undertaken in March – at the beginning of the rainy season. However, this pattern has changed with the global climate change, and the rains are neither reliable nor predictable. In 2009, both the short and long rains failed and there were severe droughts and famines in Kenya.

Figure 3: Central Kenya



Central Province is predominantly agricultural and is a key producer of tea, coffee, dairy and horticultural crops (flowers, fruits and vegetables) for both local and export markets. The smallholder farmers grow a wide range of summer flowers such as *Strelitzia*, *Ornis*, *Eryngium*, *Mobydick Arabicum*, *Ammi*, tuberose, *Carthumus* and *Rudbeckia*, some of which are sold in the Dutch auction or used in the pilot Asda bouquets.

Wilmar's smallholder flower growers are distributed in Central, Eastern and Rift Valley provinces with new growers recently recruited in Western Kenya. Farmers from Central Kenya have a longer experience in flower growing and trading with Wilmar Agro and sister company Naturegrown. They are also involved in growing a wider range of flower varieties. Due to logistics and budget limitation,

the household baseline study was confined to three districts in Central Kenya, Limuru, Thika and Nyeri (administrative units) within an 80 kilometer radius of Wilmar's packhouse in Thika.

Wilmar selected the most consistently producing growers in each group to supply the Asda market. Growers who sell to the auction market are not in production throughout the year, and their growing schedules are mainly influenced by rainfall patterns.

Sampling of Farmers

Flower farmers are organized into groups with 15-20 members. They grow different varieties depending on the soil and climate. Sampling was done to include growers of all the flowers from the three regions. The farmer groups are involved in farming activities and are usually the entry point for exporters interested in bulk quantities of produce, researchers looking to disseminate new technology and the ministry of agriculture for training, as well as other development partners. The groups also play a social role, coming together for weddings, burials and financial assistance in emergencies to meet hospital bills or school fees. They are, however, weak in business and leadership skills and often require capacity building and strengthening.

Fintrac obtained a list of flower growers supplying the auction from Wilmar Agro and Naturegrown, classified into levels by region and type of flower grown. A separate list of Wilmar and Naturegrown growers selected to supply Asda was also availed through the newly formed company Africa Flowers Ltd. Each classification level was then sampled as an independent sub-population, out of which individual farmers were randomly selected using either simple random sampling or, where the size of the stratum was large, systematic random sampling. From the exercise, 127 households growing flowers were sampled from selected groups within the study area. Households not growing flowers were randomly sampled in the neighborhood. The survey, which involved 169 households, was conducted on March 8-16, 2010.

In instances where the selected farmer was not available at the time of the interview, the supervisors randomly selected a substitute from the list of growers within the same group. The flower growers and Wilmar agronomists helped identify non-growers in the neighborhood, as no list was available.

Data Analysis and Interpretation

Data analysis was carried out using MS Excel and SPSS software. Descriptive statistics, in particular frequencies, explore and cross-tabulations were carried out to produce means and mode. Means were compared using compare means, paired sample means, one way anova and post-hoc tests. One way between-group analysis of variance tests were the major tests carried out to give the F statistic, which was the basis of accepting or not accepting the null hypothesis (H_0), which stated that the groups being compared were equal. The Games-Howell test was chosen for post hoc tests since it did not assume equal population variances and sample sizes.

Data entry was done using SPSS and analysis following the guidelines laid down by IIED. 169 questionnaires were valid, 27 percent from Nyeri, 39 percent from Thika and 34 percent from Limuru. These were further classified into four groups depending on markets (Table 2 and Table 3).

- Group 1: Asda old – farmers supplying old flower varieties for Asda market. The old flower varieties are those that have been supplied to the auction market for the last five years i.e. Arabicum (*Ornithogalum saundersiae*), Rudbekia, Scabiosa and Eryngium.
- Group 2: Asda new – farmers supplying new flower varieties for Asda market. New flower varieties are those recently introduced (2009) targeting Asda market or auction i.e. Tuberose, Ammi, Carthamus, Eucalyptus and Strelitzia.
- Group 3: Auction – farmers supplying flowers for the auction market (old varieties)
- Group 4: Non-growers – farmers not growing flowers in the neighborhood of sampled farmers.

Table 2: Sampled groups by markets

Market	N	Percent
ASDA old	10	5.92
ASDA new	37	21.89
Auction	80	47.34
Non grower	42	24.85
Total	169	100.00

Table 3: Market-District Cross-tabulation

Market	District			Total
	Nyeri	Thika	Limuru	
ASDA old	4	0	6	10
ASDA new	0	27	10	37
Auction	32	16	32	80
Non grower	9	23	10	42
Total	45	66	58	169

The majority of interviewed farmers are supplying the auction market (47.34 percent), 27.81 percent are supplying Asda market with new (21.89 percent) and old (5.92 percent) products. Non-growers represented 24.85 percent of all farmers interviewed.

Farmers from Limuru and Nyeri are supplying Asda with Eryngium and Arabicum respectively, which are classified as old flowers. Thika farmers are supplying Asda with new flowers, which include Carthamus, Ammi, Scabiosa and Eucalyptus. Limuru farmers are growing Strelitzia. Farmers from all the regions supply different flowers to the auction market. Some of the non-growers had grown flowers in the past but had given up because they couldn't find a consistent market, while others had never grown flowers or didn't belong to a farmer group.

Information on land size was collected in acres or m² but for analysis purposes all was converted into m² using the following formula:

$$1 \text{ acre} = 4,047\text{m}^2$$

RESULTS AND DISCUSSION

Household Profile

This information was captured at the beginning of the questionnaire. As the information required here was factual, there was no challenge in filling the questionnaire. In Central Kenya the husband is considered the head of the household even if the wife is the breadwinner. The respondent was whoever was present at the time of the interview, husband or wife. 34 percent of the respondents were women, 66 percent were men, and 88 percent were older than 35.

Table 4: Age distribution of the respondents by gender

Age (Years)	Men	Women
60 +	29	10
36-60	66	43
18-35	16	4
under 18	0	1
Total	111	58

Average household size (total number of members) was seven, though the mode, i.e., the number that occurred most frequently, was six for Thika and Limuru and four for Nyeri. There was no significant difference in the average household size for Nyeri, Thika and Limuru, $F(2, 166) = 0.317$, $p = 0.729$ which was greater than 0.05, the level of significance. There was also no significant difference in the mean household size by markets, $F(3, 165) = 1.24$, $p = 0.30$.

Table 5: Average household size by market

Market	Mean	Mode
ASDA old	8	4*
ASDA new	7	6
Auction	8	4
Non-grower	6	7
Overall Average	7	6

*multiple modes exist, smallest value shown

Land Ownership Regimes

This was classified into three categories:

- **Land owned**-this is either ancestral land inherited from the clan, or land that the farmer has purchased and has documents of ownership from the government.
- **Leased land**- this is land that the farmer rents out from the owner. They agree on the lease rate on a yearly or seasonal basis. The leaser owns the produce and does not share it with the owner of the land. The agreement is either verbal or written, depending on level of trust.
- **Land controlled**-This refers to amount of land under the control of the interviewed farmer, both owned and leased. He decides what to grow where.

Table 6: Mean land size

Land	Mean		
	N	M ²	Acres
Land owned	158	10,546	2.61
Land controlled	169	10,530	2.60
Land leased	30	3,775	0.93

Average land controlled included both land owned and land leased. On average this amounted to 10,530m² equivalent to approximately 2.6 acres. Only 6.4 percent of the land controlled was leased

land while 93.6 percent was owned. There was no significant difference in the mean of land controlled by markets [$F(3, 165) = 0.45$, $p = 0.72$ at $\alpha = 0.05$].

Table 7: Mean land controlled by markets

Market	M ²	Acres
ASDA old	8,034	1.99
ASDA new	10,984	2.71
Auction	11,751	2.90
Non grower	8,398	2.08
Total	10,530	2.60

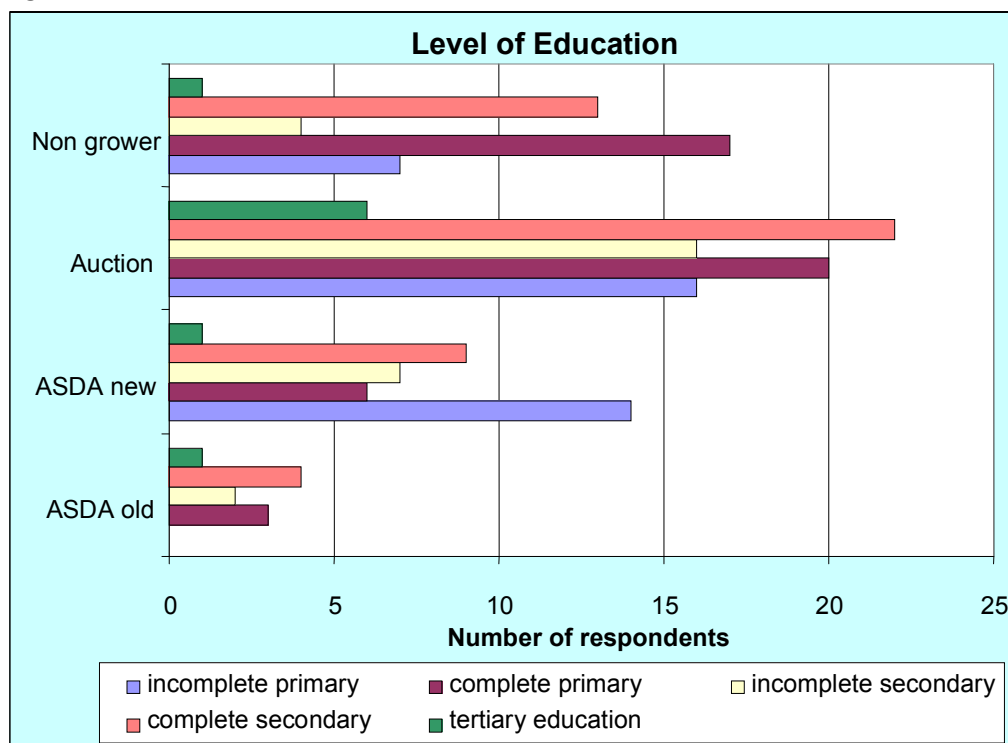
94 percent of the land was owned by the farmers working it. 158 respondents owned land which averaged 10,546 m² (2.61 acres). The sizes did not differ significantly by markets [$F(3, 154) = 0.37$, $p = 0.78$ at $\alpha = 0.05$].

Table 8: Mean land owned by markets

Market	M ²	Acres
ASDA old	7,629	1.89
ASDA new	10,630	2.63
Auction	11,771	2.91
Non grower	8,678	2.14
Total	10,546	2.61

Level of Education

The literacy level of respondents was high, with 28 percent having a complete secondary education, 27 percent a complete primary education, 29 percent an incomplete secondary education and 9 percent in the tertiary level of education (Figure 4).

Figure 4: Level of education in various markets

There was no significant difference in the frequencies in the level of education between the four markets ($F(3,165)=1.76$, $P=0.16$).

Table 9: Frequency of respondents in each level of education by region

Education Level	ASDA old	ASDA new	Auction	Non grower	Total
Incomplete primary	0	14	16	7	37
Complete primary	3	6	20	17	46
Incomplete secondary	2	7	16	4	29
Complete secondary	4	9	22	13	48
Tertiary education	1	1	6	1	9
Total	10	37	80	42	169

Asset Value

This was captured in two dimensions: livestock and value of household assets. 95 percent of the respondents had livestock in their homesteads. The value of the assets depended on the region, particularly regarding the following items: permanent house, semi-permanent house, timber/mud, irrigation equipment, poultry and mobile phones. Varying economic power of farmers in each region means a permanent house in one region is semi-permanent in another. On average, household assets were valued higher than livestock assets; the mean for livestock assets was Kshs 100,826, while the mean for household assets was Kshs 576,860.

Livestock Value

The main livestock in the study area were dairy cows, chicken, donkeys, oxen and bulls. 95 percent of the respondents kept livestock. There was no significant difference in the mean value of livestock for farmers from the four market groups, ($F(3,156)=0.119$, $P=0.949$). The average was Kshs 100,826.

Table 10: Overall average livestock value by market

Market	Mean (Kshs)
ASDA old	93,145
ASDA new	110,142
Auction	99,959
Non grower	95,862
Total	100,826

Limuru is an important dairy and poultry area and most farmers have invested in exotic dairy cows and commercial poultry that are higher value than indigenous cows and chickens in Thika and Nyeri.

Table 11: Average livestock value by market in Nyeri region

Market	Mean (Kshs)	N
ASDA old	73,250	4
Auction	50,266	32
Non grower	61,650	6
Overall average	54,081	42

There was no significant difference in value of livestock owned by farmers selling flowers to the four different markets in Nyeri region [F (2,39) =0.475, p=0.625].

Table 12: Overall average livestock value by market in Thika region

Market	Mean	N
ASDA new	96,896	27
Auction	77,175	16
Non grower	82,530	23
Overall average	87,109	66

There was no significant difference in value of livestock owned by farmers selling flowers to the four different markets in Thika region [F (2, 63) =0.385, p=0.682].

Table 13: Overall Average livestock value by market in Limuru region

Market	Mean	N
ASDA old	106,408	6
ASDA new	149,878	9
Auction	172,357	27
Non-grower	147,050	10
Overall average	155,990	52

There was no significant difference in value of livestock owned by farmers selling flowers to the four different markets in Limuru region (F (3, 48) =0.284, p=0.837).

Household Assets Value

The valuation was based on the following items: permanent or semi-permanent house, timber/mud, irrigation equipment and mobile phones. The difference in the value of household assets was mainly because of differences in the type of house. The majority of farmers in Limuru had permanent stone houses, unlike Nyeri and Thika, which had more semi- permanent houses of timber or bricks and iron sheet. In general, the mean value of household assets value did not differ significantly by market, [F (3,165) =1.488, p=0.220].

Table 14: Average household assets value by market

Market	Mean	N
ASDA old	596,470	10
ASDA new	600,089	37
Auction	620,175	80
Non-grower	469,221	42
Overall average	576,860	169

Looking at regions differently, the average household assets value differed significantly by market in Nyeri region [$F(2, 42) = 3.83$, $p=0.03$]. This was attributable to the significant difference in value of household assets between auction suppliers and those that will be supplying Asda with the old flowers.

Table 15: Average household assets value by market in Nyeri region

Market	Mean	N
Asda old	957,375	4
Auction	540,566	32
Non-grower	598,789	9
Overall average	589,260	45

Table 16: Level of significance

(I) Market	(J) Market	Significance level
Asda old	Auction	0.046*
	Non grower	0.131
Auction	ASDA old	0.046*
	Non grower	0.906
Non grower	ASDA old	0.131
	Auction	0.906

In Thika, there was no significant difference in value of household assets owned by farmers selling flowers to the four different markets in Thika region [$F(2, 63) = 1.747$, $p=0.183$].

Table 17: Average household assets value by market in Thika region

Market	Mean	N
Asda new	418,089	27
Auction	570,188	16
Non-grower	445,522	23
Overall average	464,521	66

Table 18: Average household assets value by market in Limuru region

Market	Mean	N
Asda old	355,867	6
Asda new	1,091,490	10
Auction	724,778	32
Non-grower	407,120	10
Total	695,073	58

The average household assets value differed significantly by market in Limuru region [$F(3, 54) = 4.83$, $p=0.005$]. This was because of the significant difference in household assets value between Asda old and Asda new suppliers and between Asda new and non-flower growers.

The Asda old farmers, in Kirenga group, is located in Lari constituency, which ranks 13th in the national poverty ranking with 31 percent of individuals below the poverty line while the Asda new

farmers, in Kibichiku group, is located in Kabete constituency, which is the richest in the nation, ranked first with only 17 percent of the population below the poverty line.

Table 19: Level of significance in mean difference

(I) Market	(J) Market	Significance level
Asda old	Asda new	0.00*
	Auction	0.08
	Non grower	0.97
Asda new	Asda old	0.00*
	Auction	0.18
	Non grower	0.00*
Auction	Asda old	0.08
	Asda new	0.18
	Non grower	0.05
Non grower	Asda old	0.97
	Asda new	0.00*
	Auction	0.05

* The mean difference is significant at the .05 level.

Farm Size and Uses

Respondents controlled 440 acres (1,779,528 M²); 42 acres (9.5 percent) was dedicated to flowers.

Table 20: Land controlled under flowers

Market	Land controlled		Area under flowers		Percent
	M ²	Acres	M ²	Acres	
ASDA old	58,076	14	10,906	3	18.78
ASDA new	406,426	100	67,122	17	16.52
Auction	968,375	239	90,784	22	9.37
Non growers	346,651	86	0	0	0.00
Total	1,779,528	440	168,812	42	9.49

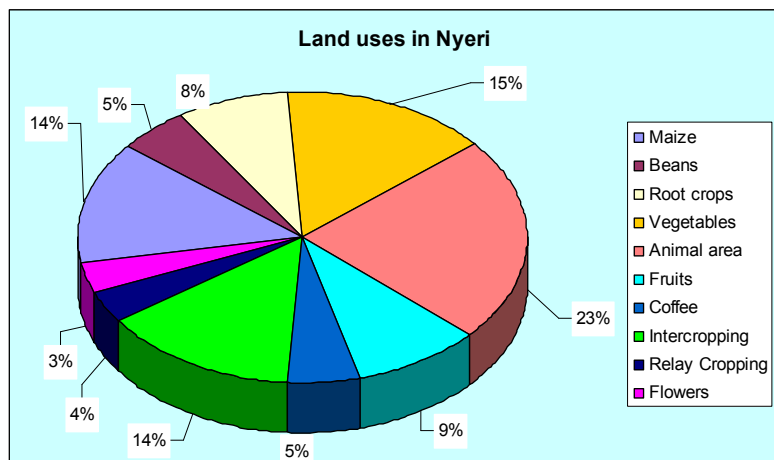
There is no significant difference in the means of area under flowers in the three markets (F (2, 122) =0.739, p=0.479)

Proportionate Land Use by Region

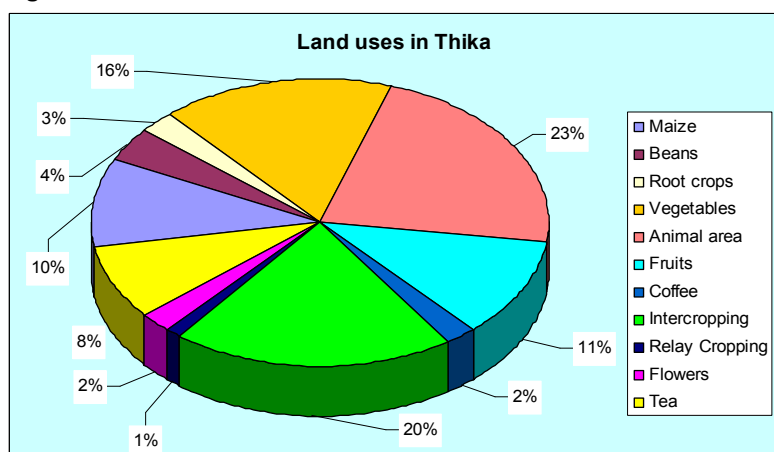
Nyeri Region

Relay cropping and intercropping were the common farming systems in the region. Flowers (mainly Arabicum) and maize were relay planted, while maize was intercropped with beans and potatoes. In Nyeri, animal area and homestead occupied the largest area, followed by vegetables and maize/beans intercropped. Flowers occupied only 3 percent of the land, fruits, mainly avocado and bananas, occupied 9 percent, and coffee occupied 5 percent.

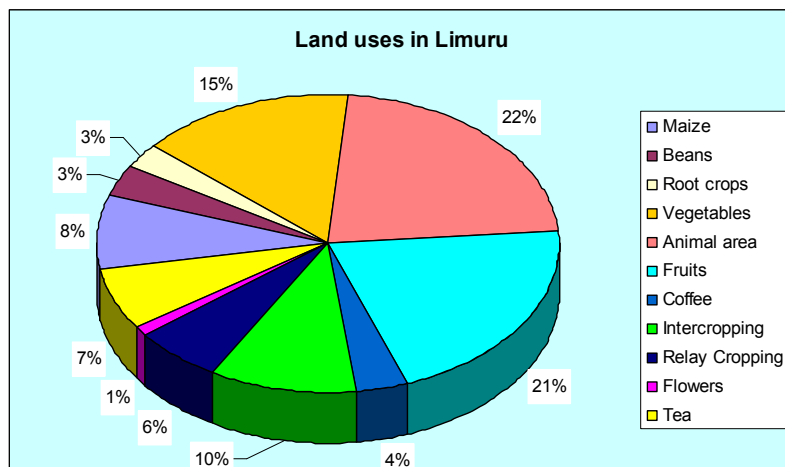
There is zero grazing of dairy cows, which are housed close to the homestead. The main vegetables are kale, cabbages and tomatoes for the local market and home consumption, and French beans, snow peas and sugar snaps for export.

Figure 5: Percent land used in Nyeri*Thika Region*

The animal area and homestead occupied the largest portion of the land, followed by maize and beans intercropped, then vegetables. French beans were an important export crop while cabbage and tomatoes were mainly grown for the local market and home consumption. Maize, beans and root crops were commonly grown as food crops in Nyeri and Thika regions. Flowers occupied only 2 percent of the land, while fruits, mainly mangoes, occupied 11 percent. In the higher altitude areas of the region, tea was an important cash crop, occupying 8 percent of the land.

Figure 6: Percent land used in Thika*Limuru Region*

Dairy and poultry farming together with homestead occupied the largest portion of the land followed by fruits and vegetables. Temperate fruits like pears, plums and apples thrived well as the temperatures are low in the region. Main vegetables included cabbage and kales for local market and home use. Flowers occupied only 1 percent of the land. Tea is an important cash crop in the region taking up 7 percent of the land.

Figure 7: Percent land uses in Limuru

The variation in percentage of land under flower production in the three regions (3 percent, 2 percent and 1 percent for Nyeri, Thika and Limuru respectively) vis-à-vis the reported average of 9.5 percent is due to seasonality. Under normal circumstances, the land under flower cultivation is the indicated 3, 2 and 1 percent; however due to crop rotation practices and when conditions are favorable, some of the portions of land under other crops (for example beans) are converted into flower beds. Thus, at the time of the baseline survey 9.5 percent of the land was under flowers.

Flower production activities

This information was captured by carrying out a bead activity to indicate proportions. 40 beads were allocated to various activities where the men and women spent time in flower production. If no time was spent on a particular activity, the record on the survey form was 0. The number of beads for each activity was used to calculate the proportion of time for each group. The exercise was carried out separately for men and women and if one was absent, only one set of data was collected and a repeat visit was made the following day with an appointment or a replacement selected from the same group.

All farmers received technical advice on growing flowers from Wilmar or Naturegrown agronomists. Flower operations are similar for all the flowers except perennials, and are replanted either after 3-5 years or 2-3 times per year. Strelitzia, Eryngium and tuberose are perennials, and it is about 6 months before the farmer can start harvesting. Arabicum is harvested after 4 months for only 1 month, and then the bulbs are cured for 2 months before replanting. Tuberose is harvested after 6 months for a period of 3 months, then it goes through a dormant period for 2 months before new flush appears. Ammi, Carthumus, Mobydick, Scabiosa, Ornis and Rudbeckia are annuals taking 3-5 months before harvesting, and farmers can grow 2 of these crops in a year.

The main flower types in the study area were Arabicum, Mobydick Eryngium, Scabiosa, Tuberose, Ornis, Strelitzia, Ammi, Carthumus and Rudbeckia. Production activities included land preparation and bed making, planting/transplanting, weeding, fertilizer application, pesticide application, harvesting, grading, packing, selling and transport to collection centers. Our hypotheses were:

H₀: Tasks in flower production are evenly shared by men and women.

H₁: Tasks in flower production are **NOT** evenly shared by men and women

The results of paired samples t-test were as tabulated below:

Table 21: Flower production activities

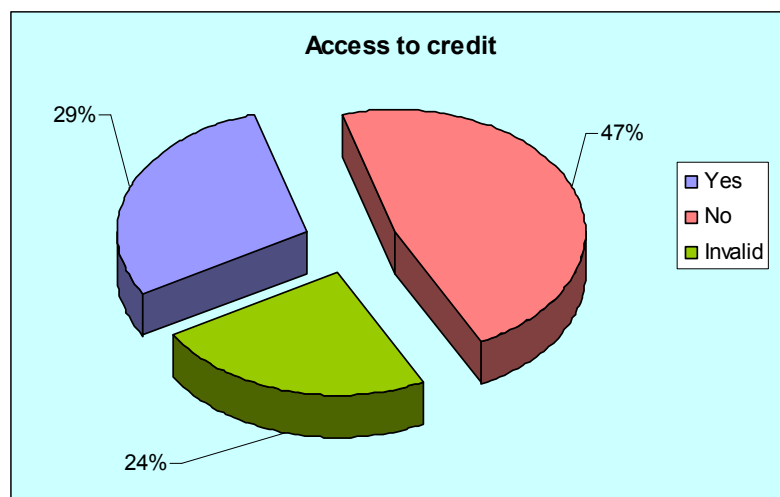
Activity	Means-Men	Means-Women	t-statistic	Sig. (2-tailed)	Conclusion
Land preparation and bed making	6.07	2.27	10.95	0.00*	Reject H ₀
Planting/transplanting	3.17	3.04	0.49	0.62	do not reject H ₀
Weeding	2.69	3.78	-3.65	0.00*	Reject H ₀
Fertilizer application	1.82	1.44	2.19	0.03*	Reject H ₀
Pesticides application	2.16	0.40	11.67	0.00*	Reject H ₀
Harvesting	2.34	1.79	2.81	0.01*	Reject H ₀
Grading	1.44	1.35	0.65	0.52	do not reject H ₀
Packaging	1.01	0.81	1.49	0.14	do not reject H ₀
Selling	0.93	0.76	1.71	0.09	do not reject H ₀
Transport to collection centers	1.11	1.01	0.73	0.47	do not reject H ₀
Others	0.73	0.48	1.64	0.10	do not reject H ₀

From the table, it is clear that men and women are involved in all activities, though not evenly shared. Men spend more time than women in land preparation and bed making, fertilizer application, pesticide application and harvesting. Women spend more time weeding. All the other activities are shared evenly between the two.

Credit facilities

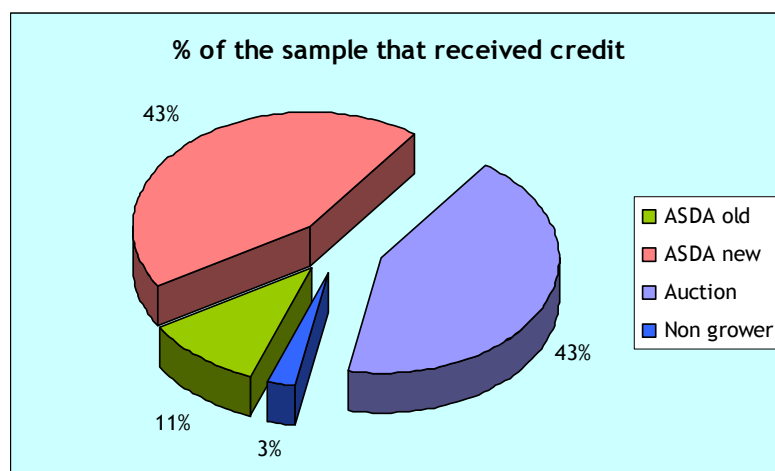
Information from the survey indicated that farmers access credit via recommendations from the exporter to financial institutions in the form of an introductory letter backed by the farmer's production and sales record for at least one year. The respondents ranked sources of credit based on how critical they were to the household, not by amount received. The exporter/buyer was the main source of credit for flower production and mainly gave loans in kind.

Figure 8: Access to credit



29 percent of respondents said they were receiving credit, all of which was in kind, i.e., inputs such as fertilizers, pesticides and seeds coming mainly from the exporter. This was further analyzed by markets (Figure 9). 47 percent did not have any kind of credit and 24 percent said they would not take credit at all and did not do the ranking exercise. Some farmers have not taken any credit but indicated their preferred source of credit if they were to access it. More farmers from Nyeri had access to credit than from Thika and Limuru. Nyeri farmers have been in flower production for more than 5 years so they have a history with the exporter and contribute to the input retainer account with the exporter. Some of the farmers in Thika and Limuru are new flower growers and have no production or sales record to help them access credit from the exporter or the banks.

Figure 9: Percentage by market that receive credit



Sources of Credit

64 percent of respondents said that they have received a cash loan for flower production from the buyer/exporter. Cash loans for other needs came from financial institutions (60 percent). 61 percent of the in-kind credit to be paid back was from buyers, while that not to be returned was mainly from the government (73 percent). The buyer usually provided training in flower production through the company's field agronomists (73 percent). Other trainers included the government (Ministry of Agriculture), research institutions and development agencies such as the USAID who are working with actors along the value chain. Financial institutions and cooperatives provide some training in credit management and financial records.

Table 22: Sources of credit and training

	Buyer	Cooperative	Projects/ NGO	Government	Individual Money Lender	Financial Institutions
Cash loan for flower production	78	17	16	5	13	10
Cash loan apart from for flower production	27	51	16	13	6	68
In-kind credit to be paid back	78	19	14	12	15	9
In-kind credit not to be paid back	34	4	20	88	1	1
Training	97	4	7	6	0	1

Sources of household income

To obtain this information, men and women were asked separately to rank household income sources from most to least significant. A second ranking to determine who controlled the income from different sources was done separately. The four most important sources of income were livestock products, summer flowers, vegetables and off-farm activities. 26 percent of women ranked livestock products as the most important source of income, followed by summer flowers (21 percent), vegetables (19 percent) and off-farm income (11 percent). The same sources of income ranked high for men, although they ranked summer flowers as the most important, followed by off-farm activities, vegetables and livestock. In Central Kenya, women are generally more involved in rearing dairy cows and chickens for egg production while men are more involved in off-farm activities like rental houses, businesses and formal employment. Vegetables were an important source of income to both men and women with 19 percent of women and 16 percent of men ranking it third.

Figure 10: Percent of men ranking household incomes as top priority

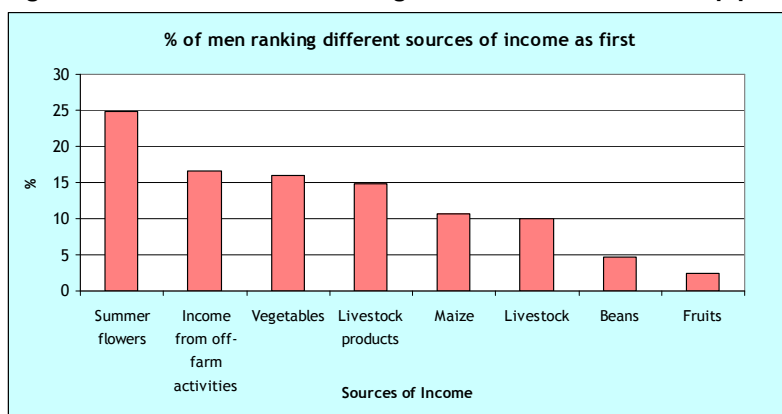
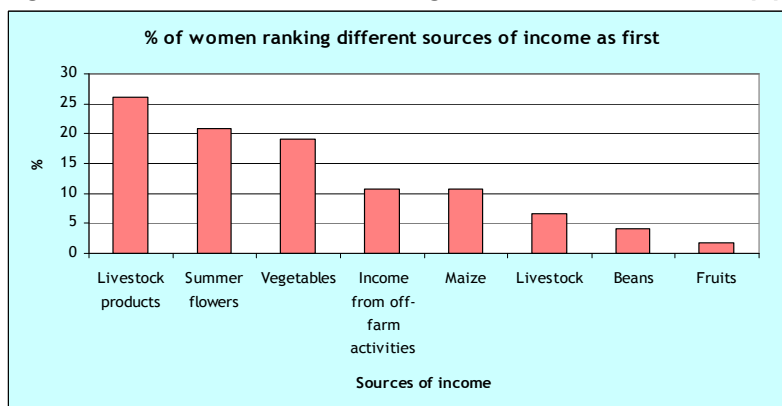
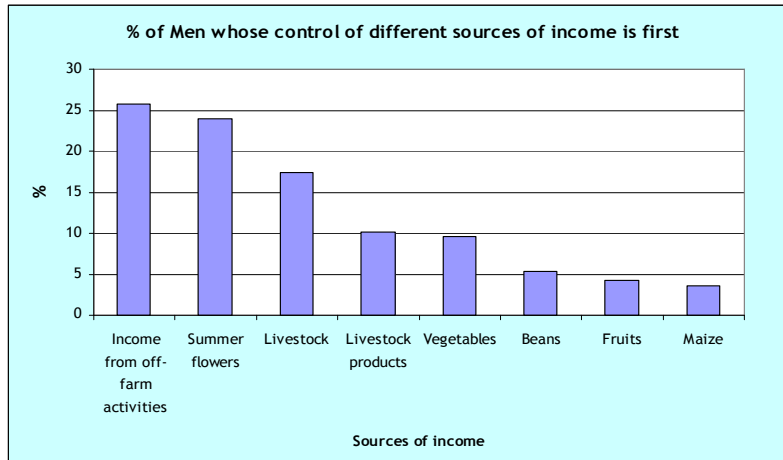
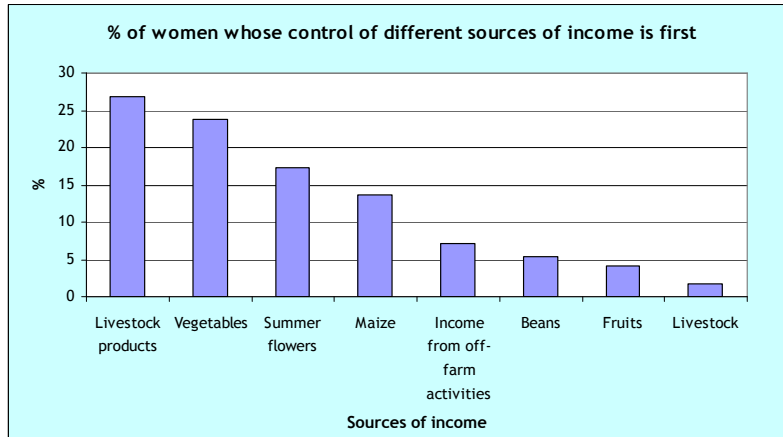


Figure 11: Percent of women ranking household incomes as top priority



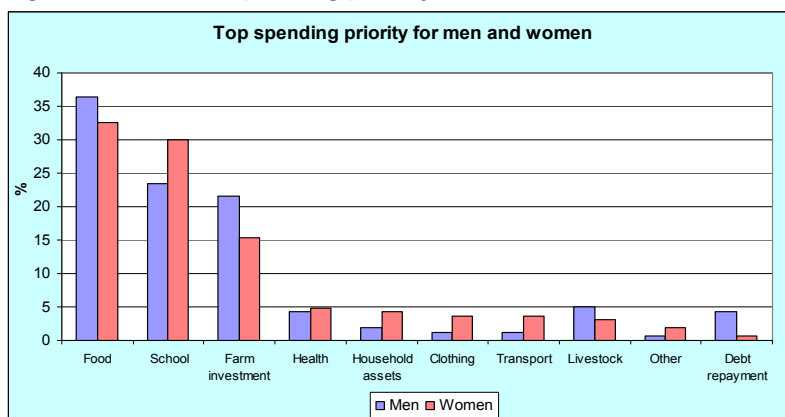
Control of Household Income

Women have more control of income from livestock products, i.e., milk and eggs, followed by vegetables and summer flowers. This coincides with the ranking of these three items in terms of importance as a source of income. Men have more control of income from off-farm activities, which is mainly income from rental houses, businesses and formal employment. They also have control of the income from summer flowers since they are more involved in the transport to selling centers and the actual selling than women. Men also control income from the sale of livestock, as they make decisions on which animal to sell.

Figure 12: Percent of men controlling household incomes as top priority**Figure 13: Percent of women controlling household incomes as top priority**

Household Expenditures

A ranking exercise was done to capture information on where household income is spent. Ranking for men and women was carried out separately to capture the understanding of each group. Generally, the top three expenditures for men and women were the same, i.e., food, school and farm investments (Figure 14).

Figure 14: General spending priority for men and women

There were no differences in spending priorities for men and women across the regions, (figures 15-17). Spending on school materials ranked among the top three in all the regions, which explains the high literacy levels in the study areas.

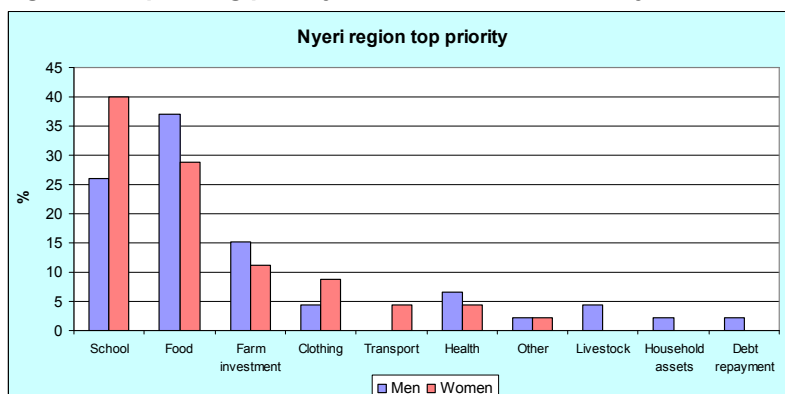
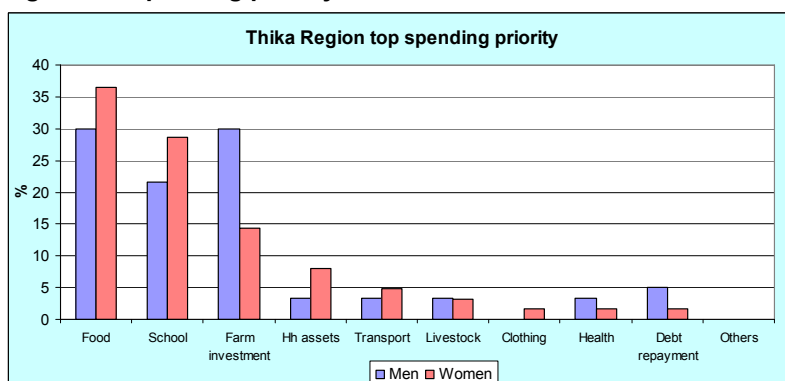
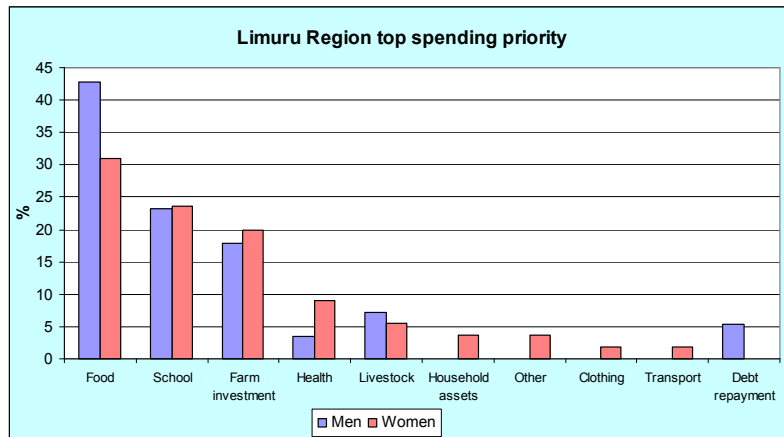
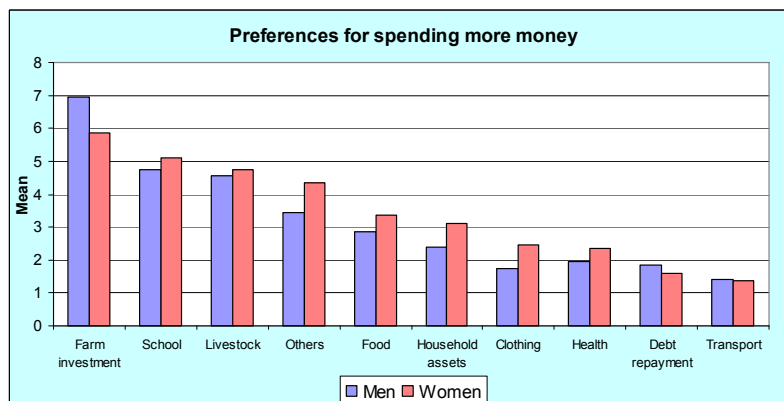
Figure 15: Spending priority for men and women in Nyeri**Figure 16: Spending priority for men and women in Thika**

Figure 17: Spending priority for men and women in Limuru

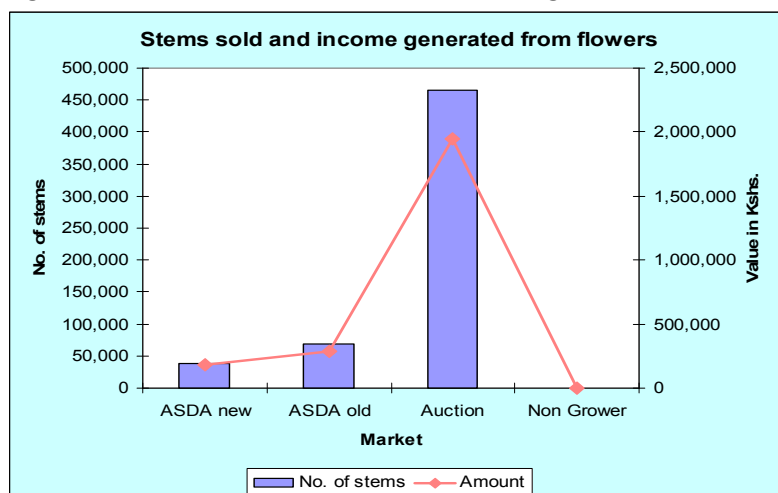
Preferences to Spend Increased Income

This information was captured by carrying out a bead activity to indicate where men and women would like to spend more money. 20 beads were used to highlight the needs where the men and women would like to spend extra money. The money could be concentrated on one need or distributed among several. Men and women did not differ much in their preferences, which were mainly farm investment and building new and more permanent houses. The second preference was investment in better education for their children. Spending in livestock would be to upgrade from indigenous to exotic breeds of cows and poultry.

Figure 18: Top spending preference for extra income

Production and Incomes from Flowers for Sampled Farmers

This information was obtained from Wilmar Agro's records of interviewed farmers during the last 12 months (March 2009-March 2010). The volume is only in marketable stems, as the farmers lost 3-10 percent of total production, mainly because of insect and disease damage or low market demand during the off season (June-August).

Figure 19: Number of stems sold and income generated from the sales

Out of 169 farmers interviewed, 42 were non flower growers. Out of the 127 flower growers interviewed, only 53 received income from flower sales to Wilmar between March 2009 and March 2010. This could be because of the drought in Kenya in 2009. Most of the farmers depend on the rains to grow flowers, and during the drought, some went out of production. Those using irrigation reduced land under production because of water shortages. The payments from Wilmar were on a weekly basis. The majority of Asda farmers growing new flower varieties did not generate any income between March 2009 and March 2010, as the crop was not ready for harvest. A few tuberose and Strelitzia farmers sold small quantities during the year, as the crop had just matured.

It is important to note that some of the farmers do not produce flowers consistently, so their records were missing from Wilmar's database and zero income was recorded for them. Only the 53 consistent suppliers who produced flowers between March 2009 and March 2010 had records.

Table 23: Stems sold and income generated by region

Region	Market category	No. of stems	Amount
Nyeri	Auction	397,525	1,810,031
	ASDA old	47,730	209,246
	Non Grower	0	0
	Total	445,255	2,019,277
Limuru	Auction	56,550	98,739
	ASDA old	20,640	73,157
	ASDA new	70	600
	Non Grower	0	0
	Total	77,260	172,496
Thika	ASDA new	37,600	183,046
	Auction	10,758	41,154
	Non Grower	0	0
	Total	48,358	224,200
Grand Total		570,873	2,415,973

Production Cost

Farmers from Kiambu and Nyeri are growing the old flower varieties Ornix, Arabicum and Eryngium for both auction and Asda markets. Strelitzia is the only new flower being grown by Kiambu farmers. Thika farmers are growing Mobydick for the auction and the new varieties, Carthamus, tuberose, Ammi and Eucalyptus for the Asda market.

It was not possible to gather data production costs during the survey, since most farmers were not keeping a record of inputs supplied by Wilmar through the retainer account. Gross marginal analysis of three flowers, Arabicum, tuberose and Eryngium, was done in focus group discussions with representatives of farmer groups. The majority of the farmers plant flowers on a quarter of an acre hence the area used for the analysis is 0.25 acres for all the varieties and the yield is defined as total number of stems harvested from the 0.25 acres over a period of one year. The planting density of the summer flower cultivations are 60 plants/m² for Arabicum, 36 plants/m² for tuberose and 16 plants/m² for Eryngium. Some varieties like tuberose and Eryngium are perennials, lasting for three to five years before replanting, while Arabicum is an annual planted twice per year. The gross margin analysis was based on only the first season's crop for each variety.

As indicated below, production costs and income generated vary among the flowers with tuberose giving good returns compared to Arabicum and Eryngium (Tables 23, 24, 25). The production costs and income are determined per annum with input costs calculated for the first year only for all varieties including perennials like tuberose and Eryngium. Tuberose has a long production period before harvest (6-8 months) so it is not popular with the farmers. Due to high market demand and low supply, the prices remain consistently higher than for the other crops throughout the year. Number of stems per unit area is also higher for tuberose.

Table 24: Gross margin analysis for Arabicum

Inputs	Cost Kshs	Income Ksh
Bulbs	4,500	
Fertilizer	1,260	
Manure	1,500	
Pesticides	120	
Labor (planting, weeding, harvesting)	1,350	
Total cost	8,730	
Gross Income (from 4,000 stems at Ksh 6.50)		26,000
Net Income	17,270	
Total	26,000	26,000

Table 25: Gross margin analysis for Tuberose

Inputs	Cost Ksh	Income Ksh
Bulbs	13,740	
Manure	1,450	
Fertilizer	3,390	
Pesticides	2,920	
Labor	18,500	
Total cost	40,000	
Gross Income (from 36,000 stems at Ksh 5.50)		198,000
Net Income	158,000	
Total	198,000	198,000

Table 26: Gross margin analysis for Eryngium

Inputs	Cost Ksh	Income Ksh
Seedlings	3,200	
Fertilizers	1,700	
Pesticides	2,300	
Labor	600	
Total cost	7,800	
Gross Income (from 8,400 stems at Ksh 4.00)		33,600
Net Income	25,800	
Total	33,600	33,600

The buying prices for all varieties fluctuate in the year therefore the average price was used for the calculation of gross income. The direct costs for all the flowers was the planting material (seed, seedlings, bulbs) which are sourced from neighboring farmers or Wilmar sources on behalf of the farmers through the retainer account. Inputs such as fertilizer, manure and pesticides are also a major direct cost for all the flower types. Labour refers to both family and hired labour. The family labour is most common and costed at the prevailing commercial rate that the farmer would pay if hired labour was used.

Quality Assurance:

54 percent of the farmers interviewed had been audited for one or more standards on various crops. The standards mentioned during the survey were Rainforest Alliance (87 percent) and GLOBALGAP. GLOBALGAP was for farmers growing export vegetables like French beans, sugar snap and snow peas while Rainforest Alliance was mentioned by tea and flower farmers. Among the flower growers, only those targeting Asda market have the Rainforest Alliance certification.

Rainforest Alliance is social and environmental performance standard aimed at large growers, and focuses on:

- Ecosystem conservation
- Wildlife protection
- Water resource conservation
- Fair treatment and good working conditions for workers
- Occupational health and safety
- Community relations
- Integrated crop management
- Soil management and conservation
- Integrated waste management

Wilmar's agronomists were trained as Rainforest Alliance trainers by the Rainforest Coordinator in Kenya in December 2009. They in turn trained 118 flower growers for the pilot Asda project. To understand and interpret the Rainforest standard in a smallholder context, Wilmar asked Fintrac's USAID-funded Kenya Horticultural Development program (KHDP) for help. KHDP has been working with local and regional traders, exporters, lobby groups and the government to help smallholder farmers comply with various standards including KenyaGAP and GLOBALGAP.

A new company, Africa Flowers was registered to handle only Asda products, and a documentation system was put in place. The grading and packing area for Asda flowers was demarcated and grading tables were painted a different color. Buckets used for Asda flowers were also a different color from

those used for auction products. Asda flowers are collected from the field and processed on different days from the auction ones to maintain quality and avoid mix ups.

The challenges in implementing the standard were interpreting it for smallholders, constructing chemical stores and the cost of protective clothing. Wilmar Agro faced challenges and incurred costs to establish a traceability system for the Asda flowers from the farm to the cold store, to avoid mix ups with flowers going to the auction market.

A local consultant in standards and farm auditing was contracted by KHDP to work closely with the agronomists to help explain the standard to the farmers and follow up on the implementation process. A one-day workshop was held with Wilmar agronomists followed by one week of field visits.

Africa Flowers and 118 farmers were audited for the Rainforest standard by a local certification body, Africert, from February 22-26, 2010. The audit was a success and a certificate was issued to the Africa Flower Company. There were direct and indirect costs associated with the audit (Table 27). The direct costs were borne by Africa Flowers, including transport of trainers to the field, protective clothing, pesticide stores, and documentation and training of farmers by the agronomists. The consultancy fee was met by USAID/Kenya Horticultural Development Program. The farmers' costs were mainly training time and labor as they implemented the standard, which took 7 working days. Their costs were based on the daily wage rate in the regions.

Table 27: Rainforest Alliance, audit certification cost for Africa flowers and 118 farmers

Audit Cost Item	Ksh	
Spray suits	90,296	Africa Flowers
24 cartridge masks and dust masks	26,480	"
Hand gloves	5,035	"
Mud boots	8,136	"
Chemicals storage boxes	120,000	"
Fabrics for demarcation of sprayed farms	1,400	"
Total	251,347	
Signage/ documentation		Africa Flowers
Printing paper	1,450	"
Embossing paper	3,530	"
Box files	1,650	"
Misc	3,400	"
Total	10,030	
Farmers training and implementation costs	37,520	Africa Flowers
Cost in man-hours (Wilmar staff) – Lunch allowance and daily rate	381,375	"
Consultant hired by USAID/KHDP	124,800	USAID/KHDP
Farmer time (7days each at Ksh 150/day	123,900	Africa Flowers
Total	667,595	
Grand Total	928,972	

Marketing

All the flower growers interviewed sell to either Wilmar Agro or Naturegrown (sister companies). Each farmer has a written contract with the buyer that is renewed every year and witnessed by a government officer from the Ministry of Agriculture or Horticultural Crops Development Authority (HCDA). The farmers are satisfied with the buyers, since they provide market and other embedded services like transport, credit in kind (inputs) and technical assistance.

Although prices and purchased volumes fluctuate throughout the year, the farmers appreciate the fact that they receive their payments one week after flowers are collected. The payment is made to individual farmer bank accounts, which reduces embezzlement by bad farmer group leaders. The farmers can withdraw from their local banks without having to travel to Wilmar or Naturegrown offices in Thika. The transaction is transparent, as every sale has a receipt, and the farmer keeps a copy. In case of anomalies, the farmer can refer to the receipt and records can be rectified.

The farmers do wish the prices could increase and be more stable and that the buyers would purchase all the flowers produced. The volume purchased and the prices fluctuate based on the auction market. Farmers are not clear on trends and how the auction operates and are not aware of prices before the purchasing date. The flow of information between the buyer and the farmers needs to be improved. Due to lack of serious competition the farmers were not certain they were getting a fair price from the current buyers and would not mind an alternative market for comparison. However, Wilmar and Naturegrown were rated as good buyers compared to the brokers who only buy during the peak season and disappear during off season.

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1. Kenya Revenue Authority Horticultural Exports data 2008-2009,
2. www.hcda.or.ke/statistics
3. www.knbs.or.ke/surveys/poverty
4. USAID Kenya Horticultural Development Program April 2010 Marketing News
5. USAID Kenya Horticultural Development Program March 2008 Marketing News

Annex I: List of Farmers Interviewed During the Household Baseline Survey

Serial no.	Region	Market category	Name of farmer	Flower variety grown
1	Nyeri	Auction	Daniel Gachiri Gichimu	Arabicum
2	Nyeri	Auction	Fredrick Karere	Arabicum
3	Nyeri	Auction	Peter Ngariria Ndirangu	Arabicum
4	Nyeri	Auction	Cyrus muriithi	Arabicum
5	Nyeri	Auction	Dickson Gathogo	Arabicum
6	Nyeri	Auction	Ann Wangithi	Arabicum
7	Nyeri	ASDA old	Samwel Gichohi Wachiuri	Arabicum
8	Nyeri	Auction	Eliud Mwangi	Arabicum
9	Nyeri	Auction	Pascal Njoroge	Arabicum
10	Nyeri	Auction	Charity Wamuyu Githui	Arabicum
11	Nyeri	Auction	Michael Wairegi	Arabicum
12	Nyeri	Auction	Dorcas wahu Gachigo	Arabicum
13	Nyeri	Non Grower	Charise Mwangi	None
14	Nyeri	Auction	Peter munuhe	Arabicum
15	Nyeri	ASDA old	Edwin Munene Macharia	Arabicum
16	Nyeri	Auction	Lucy Wangui Githogori	Arabicum
17	Nyeri	Auction	Augustine Kobia	Arabicum
18	Nyeri	Auction	Julius Njoki	Arabicum
19	Nyeri	Auction	Francis Miano	Arabicum
20	Nyeri	Auction	Grace Githongori	Arabicum
21	Nyeri	Auction	Mary Wamuyu Mbatia	Arabicum
22	Nyeri	Auction	Jackson Muriithi	Arabicum
23	Nyeri	Non Grower	Lucy Njoki Muchiri	None
24	Nyeri	Auction	Ruheni wangira	Arabicum
25	Nyeri	Auction	Dancan muteria	Arabicum
26	Nyeri	ASDA old	Joel Gakuru Thairu	Arabicum
27	Nyeri	ASDA old	Jane Wanjiru Murigu	Arabicum
28	Nyeri	Auction	lucy murungaru	Arabicum
29	Nyeri	Non Grower	William Kamunya	None
30	Nyeri	Auction	Margaret ngima Gathigo	Arabicum
31	Nyeri	Auction	Jackson kimaru	Arabicum
32	Nyeri	Non Grower	John Baptista Wachira	None
33	Nyeri	Non Grower	Joseph Ngari	None
34	Nyeri	Non Grower	Nancy Nyarwai	None
35	Nyeri	Auction	Isabella mumbi	Arabicum
36	Nyeri	Auction	Magdalene Wanjiku	Arabicum
37	Nyeri	Auction	John Mwangi Ngure	Arabicum
38	Nyeri	Auction	Agnes Nduta Ngoni	Arabicum
39	Nyeri	Non Grower	Simon Weru	None
40	Nyeri	Non Grower	Peter Gichonga Muriuki	None
41	Nyeri	Auction	Rose Wanjiru Kibiru	Arabicum
42	Nyeri	Auction	Wandia Kiongo	Arabicum
43	Nyeri	Auction	Winfred Ngonyo	Arabicum
44	Nyeri	Auction	Cecilia Wachuka Kanja	Arabicum
45	Nyeri	Non Grower	Caroline Njiri	None
46	Thika	ASDA new	Stephen Maingi Mburu	Ammi
47	Thika	Auction	Bernard Zinga Kimeu	Mobydick
48	Thika	Auction	Josephat Mwazia	Mobydick
49	Thika	ASDA new	Michael Kithuka	Ammi
50	Thika	Auction	Bernard Kalive Kithoka	Mobydick
51	Thika	Auction	Lazaro Mutuku Mwaka	Mobydick
52	Thika	Auction	Esther Wangari Muniu	Mobydick
53	Thika	ASDA new	Musyoka Muli	Ammi
54	Thika	Auction	Boniface Mburu	Mobydick
55	Thika	ASDA new	Daniel Mweu Kisuna	Ammi

Serial no.	Region	Market category	Name of farmer	Flower variety grown
56	Thika	ASDA new	Margaret Wamaitha Njogu	Tuberose
57	Thika	Non Grower	John Maina Mburu	None
58	Thika	Non Grower	James Ng'ang'a	None
59	Thika	ASDA new	Samuel Mburu Njuguna	Tuberose
60	Thika	Non Grower	Pauline Nyambura	None
61	Thika	ASDA new	Francis Thiong'o Nduati	Tuberose
62	Thika	Non Grower	Mary Wanjiku	None
63	Thika	Non Grower	Joseph Thuku	None
64	Thika	Non Grower	Patrick Mutinda	None
65	Thika	ASDA new	Robert Njuguna Kihu	Tuberose
66	Thika	ASDA new	Goko Munga	Tuberose/mobydick
67	Thika	Non Grower	Paul Mungai Macharia	None
68	Thika	ASDA new	Titus Kabute Njoroge	Rudbekia
69	Thika	ASDA new	John Njoroge Ngugi	Rudbekia
70	Thika	ASDA new	Mary Nyambura Mari	Rudbekia/mobydick
71	Thika	Non Grower	Rebecca watiri	None
72	Thika	Auction	Josiah ndegwa	Rudbekia/mobydick
73	Thika	ASDA new	Joseph Mwangi Muhia	Rudbekia/mobydick
74	Thika	Non Grower	Daniel gitau Mwaura	None
75	Thika	Auction	Eunice Njeri Nduati	Mobydick
76	Thika	Non Grower	John Mburu	None
77	Thika	Non Grower	David ndichu	None
78	Thika	Non Grower	Samuel mwangi	None
79	Thika	Non Grower	James macharia	None
80	Thika	ASDA new	John B.muya	Eucalyptus
81	Thika	ASDA new	John mwangi Gikombo	Rudbekia
82	Thika	Non Grower	Lenah Wanjiru	None
83	Thika	Non Grower	Jane Nyambura	None
84	Thika	ASDA new	Patrick Karanja Mungai	Rudbekia
85	Thika	ASDA new	Evanson Mungai Karanja	Rudbekia/mobydick
86	Thika	ASDA new	James Maina Gitau	Carthumus
87	Thika	Non Grower	David Maina Kinyanjui	None
88	Thika	Auction	Francis Ndungu	Carthumus
89	Thika	Auction	Joseph Wamula	carthumus
90	Thika	ASDA new	Peter Mbugua Gitau	Carthumus
91	Thika	Auction	Modest Njoroge	Carthumus
92	Thika	Auction	Emma Njeri	Carthumus
93	Thika	ASDA new	David Mwangi Njuguna	Carthumus
94	Thika	ASDA new	Raphael Maina Kanyi	Carthumus
95	Thika	Non Grower	Teresia Njoki	None
96	Thika	Auction	John chege Nyoike	carthumus
97	Thika	Non Grower	Agnes Wambui Kamande	None
98	Thika	Non Grower	Ben Kamau	None
99	Thika	Auction	Esther Wanjiku	Carthumus
100	Thika	Non Grower	John Kahwai Kariuki	None
101	Thika	ASDA new	Esther Wanjiku Kariuki	Scabiosa
102	Thika	ASDA new	Naomi Wanjiku Njuguna	Scabiosa/arabicum
103	Thika	ASDA new	John Muchai Muniu	Scabiosa/arabicum
104	Thika	ASDA new	Francis Macharia Machora	Scabiosa
105	Thika	Non Grower	Naomi Njeri Machora	None
106	Thika	Auction	Samson Njoroge	Carthumus
107	Thika	ASDA new	Samuel Mwangi Machora	Scabiosa
108	Thika	Non Grower	Samuel Ndungu	None
109	Thika	Auction	John Chege Mbogo	Carthumus
110	Thika	Non Grower	Nahason Nganga Muniu	None
111	Thika	ASDA new	Dancan Chege	Scabiosa
112	Limuru	Auction	Susan Njeri	Strelitzia

Serial no.	Region	Market category	Name of farmer	Flower variety grown
113	Limuru	ASDA new	Alice Wambui Njuguna	strelitzia
114	Limuru	ASDA new	Zipporah Muchai	Strelitzia
115	Limuru	Auction	Grace Wairimu	Strelitzia
116	Limuru	Auction	Sarah Kimani	Strelitzia
117	Limuru	Auction	Lucy mercy Kanja	Strelitzia
118	Limuru	Auction	Hezron kaburu	Strelitzia
119	Limuru	Auction	Elizabeth Wanjiru Muniu	Strelitzia
120	Limuru	ASDA new	Robert Moche Wambu	Strelitzia
121	Limuru	Auction	Rose Wanjiru	Strelitzia
122	Limuru	Auction	Leonard Waruiru Thuo	Strelitzia
123	Limuru	Auction	Racheal W. Kangethe	Strelitzia
124	Limuru	ASDA new	Rose Wambu Gitungo	Strelitzia
125	Limuru	ASDA new	John Gachoka Muchai	Strelitzia
126	Limuru	Auction	Gladwel Njeri Njoroge	Strelitzia
127	Limuru	Auction	Serah Wambui	Strelitzia
128	Limuru	ASDA new	Grace Wambui Matindi	Strelitzia
129	Limuru	Auction	Peter Kinuthia Njuguna	Strelitzia
130	Limuru	ASDA new	James Kamau	Strelitzia
131	Limuru	Auction	Elizabeth Murugi	Strelitzia
132	Limuru	ASDA new	Esther Wangari Muniu	Strelitzia
133	Limuru	Auction	Edward Waruiru	Strelitzia
134	Limuru	Auction	Esther Nganga	Strelitzia
135	Limuru	ASDA new	Evan Karanja	Strelitzia
136	Limuru	Auction	Jane Muchiru Ngugi	Strelitzia
137	Limuru	Auction	Margaret Nyakio	Strelitzia
138	Limuru	ASDA new	Lucy Njuhi Karimi	Strelitzia
139	Limuru	ASDA old	David Njoroge Kieu	Eryngium
140	Limuru	Auction	Peter muturi Makimai	Eryngium
141	Limuru	Auction	Patrick Njoroge	Eryngium
142	Limuru	Non Grower	Joseph Ngugi Muiruri	None
143	Limuru	Non Grower	Ruth Munjiru Karegwa	None
144	Limuru	ASDA old	Peter karoki Njehu	Eryngium
145	Limuru	ASDA old	Joseph Muniu	Eryngium
146	Limuru	Non Grower	Francis Gatimu	None
147	Limuru	Non Grower	James Mwathi Mwaura	None
148	Limuru	Auction	Peter Wathiru	Eryngium
149	Limuru	Auction	Samuel mungai	Eryngium
150	Limuru	Auction	George Waithaka	Eryngium
151	Limuru	Non Grower	Peter Mburu	None
152	Limuru	Auction	Eunice Nduta Gitari	Eryngium
153	Limuru	Auction	Joseph Kamau kinyanja	Eryngium
154	Limuru	Auction	John Kibugi Muiru	Eryngium/Ornis
155	Limuru	Non Grower	Peter mbote	None
156	Limuru	Non Grower	George Kigesa	None
157	Limuru	Auction	Richard Warari Kigecha	Eryngium/Ornis/Sau
158	Limuru	Non Grower	Alex Manji Kamau	None
159	Limuru	Non Grower	Joseph Karanja Kariuki	None
160	Limuru	Auction	John Kamau Muturi	Eryngium
161	Limuru	Auction	Joseph Kamau wangu	Eryngium
162	Limuru	Auction	David Mwangi K	Eryngium
163	Limuru	Auction	Peter Kamau Gitau	Eryngium/Ornis
164	Limuru	Auction	Peter Kamau karanja	Eryngium
165	Limuru	Non Grower	Jeremia Gakobo	None
166	Limuru	ASDA old	Joseph Njoroge Mage	Eryngium
167	Limuru	ASDA old	Francis Ndungu Njine	Eryngium
168	Limuru	ASDA old	Peter Kimani Gitemenge	Eryngium
169	Limuru	Auction	Elizabeth Muniu	Strelitzia

Annex II: Questionnaire

Kenya Cut- flower Household Baseline Survey

MARCH 2010

Household Profile

Date:

Survey Team:

Household ID:

Interviewers:

District	
Division	
Head of Household	
Name	
Age	
Sex	
Level of Education	
Latitude	
Longitude	

Key; Level of education 1=incomplete primary 2=complete primary 3=incomplete secondary 4= complete secondary 5=tertiary education

Household Demographics	Number	Notes
Men (over 60 years)		
Women (over 60 years)		
Men (age 35-60)		
Women (age 35-60)		
Men (age 18-35)		
Women (age 18-35)		
Male Children (under 18 years)		
Female Children (under 18 years)		

1. *Plots*

MAPPING EXERCISE

Do plot mapping before asking questions about crops on each plot.

Objective is to determine total area by crop.

Total farm area: Own Lease

	Estimated Size * (specify units) Size by crop (if multiple crops in portion)	Crops (from list)	Ownership (from list)	Flower Variety if present (from list)
Portion 1				
Portion 2				
Portion 3				
Portion 4				
Portion 5				
Portion 6				
Portion 7				
Portion 8				
Portion 9				

Do NOT include size of common grazing land

If intercropped, circle the crops that are together, take ONE plot size.

If relay cropped, use arrow -- → to show present crop and next crop, i.e beans → potato. Take ONE plot size.

If fruits please state the number of trees by type

Lists for Table 2

Crops Cultivated or Animals area

1. Maize
2. Beans

3. Irish Potatoes
4. Sweet Potato
5. Arrow roots
6. Cabbage
7. Tomato
8. Kale
9. garden pea
10. African leafy vegetables (ALVs)
11. Others (baby corn, leeks, coriander, eggplant, capsicum)
12. Animal area
13. Fruits (Orange, Avocado, Mango, Plum, Pear, Peach, passion e.t.c)
14. Coffee
15. Tea

Cut Flowers

1. Arabicum
2. Tuberose
3. Mollucela
4. Agapanthus
5. Statice
6. Carthamus
7. Papyrus
8. Mobydick
9. Ornithagolum
10. Eryngium
11. Birds of paradise
12. Crocosmia
13. scabiosa
14. Ammi
15. Rubbeckia
16. Other specify

Ownership Types

1. Owned self
2. Owned Group (CBO)
3. Lease self
4. Leased group

2. Assets

INTERVIEW

LIVESTOCK ASSETS	Number	HOUSEHOLD ASSETS	Number
Oxen		Radio	
Bull		Cart	
Cow		Motor Vehicle	
Heifer		Bicycle	
Calf		Permanent Stone House	
Sheep		Semi-permanent Timber /Mud House	
Goat		Bore hole/well	
Donkey		Irrigation equipment (water pump, watering bucket/can sprinkler, piping, drip kit e.t.c)	
pig		Grading shed	
Beehives		Spraying equipment	
Poultry		Mobile phone	
Fish pond		Water tank	
		Biogas	

3. Time Spent in Cut Flower Production

PROPORTION EXERCISE

Use a total of 40 Beads to determine where Men and Women spend time in flower production

If Men or Women do not spend any time on a particular activity, record 0, do not leave blank

	Men (Number of Beads)	Women (Number of Beads)	NOTES
Land Preparation and bed making			
Planting/transplanting			
Weeding			
Fertilizer application			
Pesticides application			
Harvesting			
Grading			
Packing			
Selling			
Transport to collection centers			

4. Cost of production

Refer to the last season crop of cutflowers, then ask the lowest and the highest cost of each of the activities

When did you start growing flowers?(Yr).....

1.Name of cut-flower

Area planted

	LAST SEASON CROP			Over the last two years	
	Quantity/ Unit	Cost	total	Highest cost paid	Lowest cost paid
Farm Inputs					
Seed/bulbs					
Fertilizer					
Pesticides					
Fuel for irrigation					
Packing material					
LABOUR					
	LAST SEASON CROP			Over the last two years	
	Mandays	Cost	total	Highest cost paid	Lowest cost paid
Land Preparation and bed making					
Planting					
Weeding					
Apply fertilizer					
Apply Pesticides					
Harvesting					
Grading					
Packing					
Selling					

2. Name of cut-flower.....

	LAST SEASON CROP			Over the last two years	
	Quantity/ Unit	Cost	total	Highest cost paid	Lowest cost paid
Farm Inputs					
Seed/bulb					
Fertilizer					
Pesticides					
Fuel for irrigation					
Packing material					
LABOR					
	LAST SEASON CROP			Over the last two years	
	Mandays	Cost	total	Highest cost paid	Lowest cost paid
Land Preparation and bed making					
Planting					
Weeding					
Apply fertilizer					
Apply Pesticides					
Harvesting					
Grading					
Packing					
Selling					

5. Estimate of Revenue

Refer to the last season crop

Name of flower	No. of stem Harvested	No. of stems sold	Price per stem Ksh	Total income Ksh	Sold to?

6. CROP CYCLE

	Name of flower.....	Name of flower	Name of crop.....	Name of Crop.....
Month of year	Activity	Activity	Activity	Activity
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				

7. Quality Assurance

1. Are you certified by any accredited body? -----1=Yes 2=No

If Yes please specify the namedate of certification.....

(EUREGAP, Kenyagap, Rainforest Alliance, KFC, MPS, FAIR TRADE label e.t.c)

2. Area under certification?
3. How much does it cost you for audits per year?.....Ksh
4. Is the certification for you as an individual or the group?.....
5. How much did you invest as a group/individual in order to meet the certification requirements??
 - i. TrainingKsh
 - ii. Construction of grading shade.....Ksh
 - iii. Construction of pesticide store/ toilets.....Ksh
 - iv. Buying of spraying equipment.....Ksh
 - v. Buying of Containers for chemical storage and handling.....Ksh
 - vi. Buy personal protective clothing.....Ksh
 - vii. Others Buying please specify.....Ksh

8. Importance and Sources of Household Credit and Support

Ranking and Interview (2-part exercise)

Rank credit based on how critical it is to the household (Not by amount received)

Check sources of credit, donations and training.

	Rank		Buyer	Cooperative	Projects/ NGO	Government	Individual Money Lender	Financial Institution
Cash Loan for flower Production								
Cash Loan (apart from flower Production)								
In-kind Credit (to be paid back)								
In-Kind Gift (not to be returned)								
Training								
Premium/ Top up								

Write Yes or No

SEPARATE MEN FROM WOMEN AT THIS POINT

9. Sources of Household Income

RANKING EXERCISE (2-part)

Look at Men and Women's understanding of whole household income; from most to least significant.

Rank sources of household income (men do a ranking separately from women doing ranking). Rank from most income to least income.

Rank again regarding Men and Women's perception of their level of control on an income stream, from most to least control.

	Ranking (men)	Control (men)	Ranking (women)	Control (women)	Notes
Livestock					
Summer flowers					
Livestock products (eg milk, eggs etc)					
Maize					
Beans					
Vegetables					
Fruits					
Income from off-farm activities					

10. Household Spending Priority

RANKING EXERCISE (2-part)

Rank Men and Women's understanding of where household money is spent from highest expense to lowest.

Use 20 beads to highlight where the Men and Women would like to spend more money – could be all in one area if desired, does not have to be distributed.

	Rank for	Priority	Rank for		Notes
--	----------	----------	----------	--	-------

	Men	for increased spending (Men)	Women	Priority for increased spending (Women)	
Food					
Clothing					
School and Materials					
Transportation					
Livestock					
*Farm investment					
Household Assets					
Health					
Debt Repayment					
Other?					

(*include summer flower growing, vegetable farming, livestock, irrigation systems, Technological investments, inputs e.t.c)

11. Observations and Information not captured in the 2 tables above **(Priorities that are specific for men vs. women)**

Observation	Men	Women	Notes



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